

## PERFORMANCE OF TURMERIC (*CURCUMA LONGA* L) VARIETIES IN GANGETIC ALLUVIAL PLAINS OF WEST BENGAL

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### ABSTRACT

A field experiment was conducted in the year 2014-15 and 2015-16, at Horticulture research farm, Jaguli, Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal, in factorial randomized block design with four replications using five varieties of turmeric viz. Suguna, Alleppy Supreme, Rashmi, Rajendra Sonia and Duggirala. The varieties varied in their production potential, growth characters and curcumin content. The pooled data revealed that the variety Rajendra Sonia produced maximum plant height (128.56 cm), number of tillers per plant (2.77), number of primary rhizomes (6.81), length of primary rhizomes (6.36 cm) and rhizome yield per hectare (320.37 q/ha) followed by suguna. Therefore, results led to a conclusion that, the two varieties viz., Rajendra Sonia and Suguna were superior among all the varieties during both the seasons and are suitable for cultivation in gangetic alluvial plains of West Bengal, whereas, suguna variety exhibited highest curcumin content (4.53 g/100g) followed by Rajendra Sonia (4.16 g/100g).

**KEYWORDS:** Turmeric, Performance, Varieties & Curcumin

**Received:** Jun 08, 2017; **Accepted:** Jun 28, 2017; **Published:** Jul 17, 2017; **Paper Id.:** IJASRAUG201729

### INTRODUCTION

Turmeric (*Curcuma longa* L.) is an important, sacred and ancient spice of India. It is a major rhizomatous spice produced and exported from India. Turmeric is an herbaceous perennial plant, belongs to family Zingiberaceae, and comprises about 70 species. Mostly, it is found throughout south and South- East Asia. It is cultivated for its underground rhizomes, which is used as spice and condiment, dye stuff and in cosmetic and drug industry, particularly in the preparation of anti cancerous medicines. It can be vegetatively propagated using its underground rhizomes. India, being the world's largest producer of turmeric, it was grown in an area of 2.33 lakh hectares with a total production of 11.90 lakh tonnes during 2014-15[1]. Although wide genetic variability exists in this crop, with regard to the yield and yield attributes, not much work has been done on crop improvement through the selection of superior types, with high yield in gangetic alluvial plains of West Bengal. Hence, the present study was carried out to evaluate the performance of different varieties with regard to growth, yield and quality components of turmeric.

### MATERIALS AND METHODS

The field experiment was carried out at Horticulture research farm, Jaguli, Bidhan Chandra Krishi Viswavidyalaya, Nadia and West Bengal conducted during 2014-15 and 2015-16. The trial was laid out in factorial randomized block design (FRBD), with four replications using five varieties of turmeric viz. Suguna, Alleppy Supreme, Rashmi, Rajendra Sonia and Duggirala. The rhizomes were planted in second week of April each year

in ridge and furrow method at spacing of 30 cm between rows and 25 cm between the plants and followed all the cultural practices as per standard package of practice, as and when required. The observations on growth, yield and yield attributes were recorded on five randomly selected plants from each plot, and curcumin (g/100 g) was estimated in the laboratory by the method given by [2]. The data collected from the field were subjected to statistical analysis by following the procedure laid out [3]. Accordingly, the standard error of mean (S. Em. $\pm$ ) and the value of critical difference (C. D) between the treatment means at 5% level of significance was determined [4].

## RESULTS AND DISCUSSIONS

A perusal of data presented in Table 1 shows significant variations among the cultivars. Maximum plant height (128.56cm) was recorded in Rajendra Sonia, which was statistically at par with those of Suguna, Supreme, rashmi, duggirala. The results are in line with those of [5] and [6]. The most important yield contributing characters in turmeric are the number of tillers, number of rhizomes and their size [7]. More number of tillers per plant were produced by Rajendra sonia (2.77) closely followed by Suguna (2.40). More number of primary rhizomes per plant were produced by Rajendra Sonia (6.81) closely followed by Suguna (6.69). However, Duggirala produced less number of rhizomes per plant. [5] Reported that Rajendra Sonia also produced maximum number of rhizomes and length of rhizomes, and [8] reported minimum rhizome length in duggirala. Similar results were observed in the present investigation. The data presented in Table 1 shows significant variation among the turmeric types with regard to the yield of turmeric per hectare. Rajendra Sonia produced more rhizome yield per hectare (320.37q) than all other varieties, followed by Suguna, whereas, the variety Duggirala recorded significantly lower rhizome yield per hectare. Similar results were obtained by [5], [9] and [10]. Curcumin is very important compound, which is found in turmeric and acts as anti-oxidant. Maximum curcumin (4.53 g/100g) content was found in the variety Suguna, which was significant among all the varieties evaluated whereas, minimum curcumin (1.43 g/100g) was recorded in the variety Duggirala. The variation in regard to rhizome characters and fresh rhizome yield among the cultivars could be attributed to genetic potential of a genotype and environmental condition, as reported by [11].

## CONCLUSIONS

Thus, it can be concluded that among the turmeric varieties evaluated in gangetic alluvial plains of West Bengal, the varieties i.e. Rajendra Sonia and Suguna were the best varieties for the characters studied, like plant height (cm), number of tillers/plant, number of primary rhizomes and yield per hectare, whereas, the varieties Suguna and Rajendra Sonia contained highest amount of curcumin.

## ACKNOWLEDGEMENT / FUNDING

At the outset, I express my sincere gratitude to my teacher and Chairman, Dr. Anupam Pariari, Professor, Department of Spices and Plantation Crops, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur. Who have meticulously planned the undertaken Research programme. The assistance and help received during the course of investigation was been duly acknowledged.

## Author Contributions

- S. VENUGOPAL.<sup>1</sup>, - Myself has carried out the entire Research programme.
- PARIARI, A.<sup>2</sup>, - My teacher and Chairman.

## Abbreviations

T: Treatment/s

@: at the rate of

cm: Centimeter

CD: Critical difference

SE (m)  $\pm$ : Standard error mean

gm: Gram

etc: et cetera (= and the rest)

t/ha: tonnes per hectare

kg/ha: Kilogram per hectare

m: Metre

/: Per

%: Percentage

m<sup>2</sup>: metre square

## REFERENCES

1. NHB. (2015). *Indian Horticulture Database*, National Horticulture Board, Ministry of Agriculture, Government of India, Gurgaon. pp. 6 & 285.
2. Sadasivam, S. and Manickam, A. (1992). In: *Biochemical Methods for Agricultural Sciences*, Wiley Eastern Ltd., New Delhi, pp. 185-186.
3. Gomez, K. A. and Gomez, A. A. (1984). *Statistical Procedures for Agricultural Research* (2<sup>nd</sup> edition). A wiley Inter. Sci. Pub. New York.
4. [4] Fisher, R. A and Yates, F. (1963). *Statistical tables for biological agricultural and medical research*. Oliver and Boyd London. pp. 46-63.
5. [5] Choudhary, A.S., Sachan, S.K. and Singh, R.L. (2006). *Studies on varietal performance of turmeric (Curcuma longa L.)*. *Indian J. Crop Sci.*, 1 (1-2): 189-190.
6. Singh, D.K., Aswal, S., Aswani, G. and Shiv hare, M.K. (2013). *Performance of planting material on growth and yield of turmeric under guava orchard*. *Hort Flora Res. Spectrum*, 2(2): 116-120.
7. Chadha K.L. 2001. *Turmeric, Handbook of Horticulture*, ICAR, New Delhi.
8. Philip J. and Nair P.S. 1983. *Morphological and yield characters of turmeric types*, *Indian Spices*, 20: 13-20.
9. Ramakrishna M., Reddy P.S. and Padmanabham V. 1995. *Studies on the performance of sort duration varieties of turmeric in southern zone of Andhra Pradesh*. *J. Plantation Crops* 23: 126-127.
10. Hegde S., Venkatesh J. and Chandrappa. 1997. *Performance of certain promising cultivars of turmeric (Curcuma domestica L.) under southern dry region of Karnataka*. *Ind. Cocoa. Arecanut and spices. J.*, 21: 11-13.

11. Aiyadurai, S.G. 1966. A review of research on spices and cashew in India. Indian Council of Agricultural Research, New Delhi. pp: 104-119.

## APPENDICES

**Table.1: Growth, Yield and Quality Characters of Different Turmeric Varieties**

Varieties	Plant Height (cm)	Number of Tillers Per Plant	Number of Leaves Per Plant	Number of Primary Rhizomes (cm)	Length of Primary Rhizomes (cm)	Girth of Primary Rhizomes (cm)	Yield Per Plot (kg)	Projected Yield Per Hectare (q/ha)	Curcumin Content (g/100g)
Suguna	123.28	2.40	13.60	6.69	6.23	2.57	12.33	308.18	4.53
Alleppy Supreme	113.44	2.23	14.33	5.10	6.01	2.11	10.59	264.91	1.41
Rashmi	112.85	2.2	11.22	5.40	5.99	2.34	9.49	237.40	3.87
Rejendra Sonia	128.56	2.77	15.75	6.81	6.36	2.35	12.81	320.37	4.16
Duggirala	108.77	2.02	11.65	5.25	4.55	1.93	7.87	196.75	1.24
S.Em±	0.965	0.019	0.116	0.047	0.048	0.019	0.085	2.15	0.029